$$\int_a^5 = -\int_5^a + \int_a^3 = \int_5^3 = 4 - \int_a^5$$

$f(3) = 4 \qquad \int_a^3 = 4$

$f(5) = ? \qquad \int_a^5 = ?$

$f(x) = \int_a^x \ln(2+\sin t)\,dt$

$$\int_a^3 + \int_3^5 = \int_a^5$$

$$4 + .555 = \int_a^5 = f(5)$$

Nov 23-11:58 AM

53. solve $\left(\int_0^x e^{-t^2}\,dt = .6, x \right)$

$$F(x) - F(0) = .6$$

$F(x)$ is an antiderivative of e^{-x^2}

$$\int e^{-x^2}\,dx = ?$$

$F(x) = e^{-x^2}$ ~~$(-x^2)$~~

$F'(x) = e^{-x^2} \cdot (-2x)$

Nov 23-12:17 PM

irrational π

$x = \sqrt{2}$ $x^2 = 2$

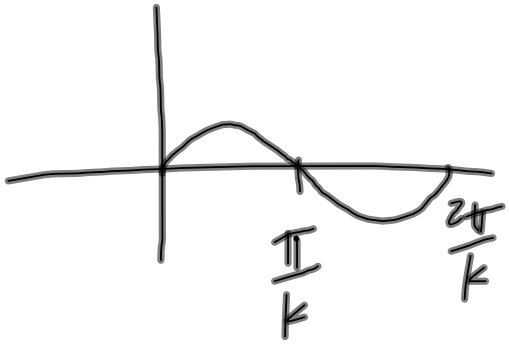
can't write as $\frac{p}{q}$ p, q integers

rational can write as $\frac{p}{q}$

Nov 23-12:33 PM

$y = \sin(kx)$

63. ~~period~~ $= \frac{2\pi}{k}$

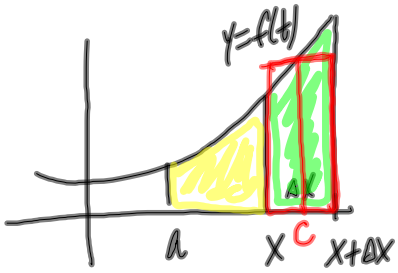


$$\int_0^{\pi/k} \sin(kx)\,dx = -\frac{\cos(kx)}{k}\Big|_0^{\pi/k} = \frac{2}{k}$$

take der $\sin(kx) \cdot k$

Nov 23-12:37 PM

5.4 proof of FTC



define $F(x) = \int_a^x f(t)\,dt$

the whole area

$\Delta F = F(x+\Delta x) - F(x)$

$\frac{\Delta F}{\Delta x} = \frac{F(x+\Delta x) - F(x)}{\Delta x}$

$\Delta F = f(c)\,\Delta x$

$\frac{\Delta F}{\Delta x} = f(c)$

$\lim_{\Delta x \to 0} \frac{F(x+\Delta x) - F(x)}{\Delta x} = \lim_{c \to x} f(c)$

$F'(x) = f(x)$

says $F(x)$ is an antider. of $f(x)$

Nov 23-12:42 PM

$\frac{d}{dx}\int_0^x \sin t\,dt = \sin x$

$\frac{d}{dx} F(x) = f(x)$

$F'(x) = f(x)$

Nov 23-12:49 PM

$$\frac{d}{dx}\int_0^{x^2} \sin t\, dt = \sin x^2 \cdot 2x$$

read EX 3

↑ chain rule

Nov 23-12:50 PM